
APPENDIX B

PROJECT PLAN FOR THE CHEMICAL SAFETY VULNERABILITY REVIEW



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OFFICE OF ENVIRONMENT, SAFETY AND HEALTH

**Project Plan
for the
Chemical Safety
Vulnerability Review**

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INTRODUCTION

Based on direction from the Secretary of Energy,¹ the Assistant Secretary for Environment, Safety and Health established the Chemical Safety Vulnerability Working Group to identify and characterize adverse conditions or circumstances involving potentially hazardous chemicals at facilities owned or operated by the U.S. Department of Energy (DOE).² This project plan describes the methodology and schedule developed by the Working Group to accomplish these goals.

Specifically, the Working Group is tasked with identifying chemical safety vulnerabilities associated with conditions or circumstances that might result in (1) fires or explosions from uncontrolled chemical reactions, (2) exposure of workers or the public to chemicals, or (3) releases of chemicals to the environment. The Working Group will evaluate a range of facilities (based on facility type and operational status), giving special attention to facilities being transferred to, awaiting, or undergoing decontamination and decommissioning (D&D). The review will identify conditions or circumstances related to chemical safety that have received little or no attention but that may become more important with time. Facilities with stable chemical processes or inventories that may be subject to degradation over time will also be analyzed for vulnerabilities.

The Working Group's final report will identify facility-specific and generic (i.e., complex-wide) vulnerabilities involving hazardous chemicals. The final report will also enhance the Department's knowledge about the types and locations of existing chemical inventories that are of potential concern to worker health and safety, especially at inactive facilities.

The information obtained as a result of this review will permit the identification and prioritization of vulnerabilities affecting chemical safety as DOE proceeds with D&D of inactive facilities. Consequently, DOE will be able to implement measures to minimize hazards confronting workers, the public, and the environment before cleanup begins. As chemical safety vulnerabilities are identified, a parallel activity will be initiated to develop a management response plan for addressing these vulnerabilities.

The Secretary directed the Office of Environment, Safety and Health (EH) to lead this review, with the full participation of DOE line programs with operational responsibilities. To ensure that a high level of collaboration is achieved across the DOE complex, EH developed the following methodology:

- A Working Group, including representatives from DOE line programs with operational responsibility, was convened to develop the project plan;

¹Memorandum from Hazel R. O'Leary to Tara O'Toole, "Vulnerability Review of Chemical Safety at Department of Energy Facilities," dated February 14, 1994.

²Memorandum from Tara O'Toole to all Departmental Elements, "Vulnerability Review of Chemical Safety," dated February 10, 1994.

- Field personnel have been tasked with collecting data for analysis by the Working Group and with identifying lessons learned to be shared with other DOE elements;
- Field personnel will be actively involved in the data verification process;
- Working Group members representing DOE line programs with operational responsibilities will review the data collected to identify, characterize, and prioritize chemical safety vulnerabilities; and
- Working Group members representing DOE line programs with operational responsibilities will participate in developing the management response plan.

BACKGROUND

As the United States enters the post-Cold War era, the mission of the Department is undergoing a dramatic shift: the nuclear weapons complex is being sharply downsized, and DOE is redirecting its emphasis to environmental cleanup and to the development of new energy technologies. As a result, many DOE facilities that once used significant quantities of hazardous chemicals as part of the nuclear weapons production process have been shut down and are awaiting D&D. In some cases, hazardous chemicals and chemical wastes associated with these facilities remain in place—a situation that creates the potential for current and future vulnerabilities affecting the environment, the public, and worker safety and health.

To establish priorities for transition efforts at facilities awaiting D&D, the Office of Environmental Restoration and Waste Management (EM) is conducting the Surplus Facility inventory and Assessment Project. This effort will identify (1) facilities awaiting transition to D&D and (2) chemical and radiological inventories associated with these facilities. Additional action is required, however, to identify generic and facility-specific vulnerabilities associated with chemicals and chemical wastes not covered by this project and to ensure that actions to minimize hazards are in place before cleanup activities begin (which, in some cases, may be years away).

Many DOE facilities built during World War II or shortly thereafter contain few of the safety systems that are now required. World War II era buildings were built for multiple purposes, and their designs included some flexibility to accommodate future modifications. Over the years, this practice has resulted in numerous facility modifications and mission changes. Because of past weaknesses related to older safety systems and the lack of effective configuration management, the Department's leaders are concerned that there may be chemical safety vulnerabilities associated with these aging facilities. As older facilities reach the end of their design life and await D&D, or yet another modification, the potential for degradation of systems through the action of unknown or unspecified chemicals is heightened. Moreover, many operating facilities using hazardous chemicals may be subject to significant vulnerabilities that have not yet been addressed.

Although aggressive chemical safety programs are not new, the Department is concerned that, historically, chemical safety for operating facilities has not received the same foresight, attention, and rigor associated with nuclear safety. This concern has led to questions about

the adequacy of (1) safety measures (procedural, administrative, or hardware) implemented over the design life of DOE facilities and (2) management's understanding of existing chemical safety vulnerabilities. The current review is based on the premise that these vulnerabilities must be identified and adequately addressed to ensure that the environment, the public, and worker safety and health are protected now and in the future.

To respond to these concerns, the Secretary of Energy tasked EH with leading a working group to evaluate "chemical safety vulnerabilities associated with Department of Energy facilities." This effort is to be completed by July 29, 1994, and should "have the full participation of Department of Energy line programs with operational responsibilities." The review should "identify, characterize, and assess the environment, safety, and health vulnerabilities associated with hazardous chemicals at Department of Energy facilities." In addition, the review should "give particular attention to evaluating inactive facilities targeted for or currently undergoing decontamination and decommissioning."

The Assistant Secretary for Environment, Safety and Health directed the Chemical Safety Vulnerability Working Group to coordinate closely with all affected departmental elements to ensure that the impact of the review on field operations is minimized. The Assistant Secretary established the following specific goals for the Working Group:

- "Identify any existing situations involving hazardous chemicals that need to be addressed to protect the environment, or public or worker health";
- "Enhance the existing inventory of the types and locations of chemicals that are of concern to worker health and safety, especially at inactive facilities";
- "Identify and prioritize vulnerabilities related to future decontamination and decommissioning activities at inactive facilities"; and
- "As vulnerabilities are identified, a management action plan for eliminating or addressing such vulnerabilities will be developed."

The Secretarial tasking will also require that the Office of Defense Programs (DP) broaden the scope of its review of organic-oxidizer vulnerabilities to include other facilities that may have operations involving organic-oxidizer reactions. The DP study was originally initiated as a response to a chemical explosion at the Tomsk-7 nuclear processing facility in Russia. (The explosion has been attributed to a runaway organic-nitrate chemical reaction.) The organic-oxidizer review is also scheduled for completion by July 29, 1994. In addition, the Secretary directed that the Chemical Safety Vulnerability Review be closely coordinated with the Surplus Facility Inventory and Assessment Project being conducted by the Office of Facility Transition and Management (EM-60),

The EH Chemical Safety Program, established in March 1992, has been the Department's principal mechanism for identifying chemical safety vulnerabilities. The primary objective of the initial activities of the program was to identify, through a limited sampling process, the existence of chemical hazards that posed imminent danger or threat to workers, co-located workers, the general public, or the environment. This initial effort resulted in DOE/EH-0282, "Task Group Report to the Assistant Secretary for Environment, Safety and Health on

Oversight of Chemical Safety at the Department of Energy,” dated November 1992. No imminent danger situations were identified. Since that time, the EH Chemical Safety Program has participated in developing chemical safety training and guidance, as well as conducting a limited number of reviews. However, too little progress has been made in conducting reviews that will identify problems likely to confront the Department in the future.

The Chemical Safety Vulnerability Working Group will go beyond other efforts by considering end-of-life chemical safety issues affecting facilities that are no longer operational. The current review will include a larger and more diverse sampling of facilities to provide a better indication of the chemical safety vulnerabilities that confront a variety of DOE facilities. Working Group members will try to avoid duplication of past efforts, while seeking added insights into understanding issues related to chemical safety.

SCOPE

It is not possible to visit every DOE facility for the purposes of this review. Therefore, the Chemical Safety Vulnerability Working Group will focus its efforts to achieve the maximum results possible in the time available. Based on guidance provided by the Secretary of Energy and the Assistant Secretary for Environment, Safety and Health, the review will concentrate on identifying chemical safety vulnerabilities associated with facilities being transferred to, awaiting, or undergoing D&D. The review will attempt to identify conditions involving hazardous chemicals that need to be addressed in order to ensure the protection of the environment, the public, and worker health and safety. Operating facilities with stable chemical processes or inventories that may be subject to degradation over time will also be surveyed. This approach will accomplish the following:

- Identify chemical safety vulnerabilities associated with specific facilities;
- Use facility-specific vulnerabilities to identify generic chemical safety vulnerabilities with applicability to the entire DOE complex; and
- Improve the existing inventory relative to the types and locations of chemicals that affect worker safety and health.

In the established focus areas, the Chemical Safety Vulnerability Working Group has designated a number of facilities across the DOE complex for review. (See “Phase II - Field Self-Evaluation” below for an explanation of the selection process.) Field personnel have been asked to conduct self-evaluations at selected facilities using a preestablished question set. Based on these self-evaluations, several sites will be selected by the Working Group for field visits, during which the data provided by the field will be verified and chemical safety vulnerabilities will be further evaluated.

PROJECT APPROACH

The concept of a vulnerability review involves more than looking at risks. It involves looking at real hazards and how workers, the public, or the environment could be injured. The following principles will guide the Working Group's approach to this review:

- Emphasis will be placed on what can go wrong in the future, as well as what can go wrong now;
- Generic vulnerabilities with complex-wide implications will be characterized and prioritized to enable the Department to take actions that will eliminate or reduce potential consequences;
- Data collected and reported to the Working Group will include detailed background information that can be used to formulate policy for important departmental issues;
- Facility-specific chemical safety vulnerabilities will be sought and identified; and
- The review will not be conducted as a compliance review.

The Chemical Safety Vulnerability Working Group will approach the project in phases, as follows:

- Phase I - Organization, The project plan and all its elements were developed in cooperation with line managers from field and program organizations.
- Phase II - Field Self-Evaluation. Initial data related to chemical safety vulnerability will be collected from designated facilities across the DOE complex.
- Phase III - Field Verification. Field verification teams representing the Working Group will conduct facility visits at a limited number of sites to verify and expand data collected during Phase II.
- Phase IV - Vulnerability Prioritization. Identified vulnerabilities will be characterized and prioritized as facility-specific or generic vulnerabilities. The prioritization of vulnerabilities will be based on the immediacy and severity of their potential consequences.
- Phase V - Management Response Plan Development. The management response plan will address actions to be taken to eliminate or reduce the potential consequences associated with identified chemical safety vulnerabilities. Sites will develop plans for facility-specific vulnerabilities, and the Working Group will develop the plan to address generic vulnerabilities.
- Phase VI - Report Preparation. The final report will document the results of the Working Group's activities.

Since the Chemical Safety Vulnerability Working Group is coordinating its efforts with the EM Surplus Facility Inventory and Assessment Project, information provided by EM has been used to select transition facilities for review. Additional information that may be available through this mechanism includes the following:

- Information on hazardous chemical inventories;
- Status of equipment and facilities;
- Potential threats to worker safety; and
- Potential threats to the environment.

The DP Tomsk lessons-learned review of organic-oxidizer vulnerabilities is another important activity associated with the Secretary's direction to conduct a thorough evaluation of chemical safety vulnerabilities across the DOE complex. Scheduled for completion by July 29, 1994, the DP review originated as a response to an explosion at the Tomsk-7 nuclear processing facility in Russia. The Chemical Safety Vulnerability Working Group will coordinate with the DP organic-oxidizer review team relative to significant issues of mutual interest, and the two studies will coordinate their work in a manner that will minimize duplication.

Phase I - Organization

The Working Group consists of representatives of line management from field and program offices for both DOE and contractor organizations. A core group of EH personnel was assigned to the Working Group to organize and lead the effort. (A list of core group personnel is provided in Attachment 1.) Core group personnel developed a draft project plan and held a 2-day organizational meeting for the Working Group in Gaithersburg, Maryland, on March 1 –2, 1994. This project plan is a product of that meeting. (An attendance list and an agenda for the meeting are provided in Attachment 2.)

The Chemical Safety Vulnerability Working Group is required to submit a final report to the Secretary of Energy by July 29, 1994. Based on this deadline, a project schedule was developed that would fulfill all Working Group objectives. (The schedule is provided in Attachment 3.) This schedule does not make allowances for delays. Given the ambitious agenda and tight timetable of this review, it is imperative that all Working Group members meet the milestone dates specified in the project schedule.

The Co-Chairmen of the Chemical Safety Vulnerability Working Group will assign responsibility for coordinating efforts with the EM Surplus Facility Inventory and Assessment Project to a member of the core group. Cooperation of this kind will allow the Working Group to determine what specific data from the EM project will be available for the Working Group's use, how that information can be retrieved from the data base, and how the two groups can cooperate to minimize the impact of their activities on field operations.

The Co-Chairmen will also assign responsibility for coordinating with DP on the expanded organic-oxidizer review to a member of the core group. Because the DP study will be completed concurrently with the Working Group effort, the final report will not be able to incorporate all applicable aspects of the organic-oxidizer review. The Working Group report

will, however, discuss broad issues associated with the organic-oxidizer review to provide an overall perspective of the chemical safety vulnerabilities confronting DOE. The core group member assigned to coordinate with the organic-oxidizer review team should establish a means for exchanging information and should ensure that the Working Group does not duplicate DP's efforts.

Phase II - Field Self-Evaluation

The field self-evaluation process is designed to obtain information about chemical safety vulnerabilities at a wide range of DOE facilities and to ensure participation from DOE line organizations. A total of **84** facilities at 29 DOE sites was selected to conduct self-evaluations. (The sites and facilities selected to participate in this activity are listed in Attachment 4.) Selection was based on the types of chemical hazards known to exist at given facilities and on the need to provide an appropriate cross-section of DOE sites. (The criteria used for selecting specific facilities are provided in Attachment 5.)

Local DOE line organizations will be responsible for timely and accurate completion of the field self-evaluations. Working Group members assigned to these organizations will brief senior management on the background, schedule, and requirements of the field self-evaluations. Local DOE line organizations will also be responsible for working with management and operations (M&O) contractors in preparing the management response plan and keeping the cognizant DOE operations office and program office informed.

During the self-evaluation phase, a series of four conference calls will be conducted to answer questions and to provide weekly updates on the status of the review. Each conference call can accommodate up to 60 participants. The first call was conducted on Tuesday, March 8, 1994, at 1:30 p.m. (Eastern time). (Subsequent calls will be conducted at the same time on March 15, March 22, and March 29, 1994. The need for additional conference calls will be reviewed as appropriate.)

Working Group members representing the sites (contractor and DOE field personnel) will provide assistance for organizing appropriate self-evaluation teams, disseminating information to the facilities, and collecting and transmitting self-evaluation results to the Working Group. The actual conduct of field self-evaluations should be accomplished by personnel at each facility who are knowledgeable about both the facility and the subject matter involved (e.g., chemical operations, chemical safety, chemical inventory, and damage or release mechanisms). In the **case** of inactive facilities with no **assigned personnel**, local DOE line management should coordinate with site M&O contractors to ensure that self-evaluations are performed by qualified personnel.

To permit the Working Group to analyze the data on a common basis and to identify potential chemical safety vulnerabilities at a large number of facilities, a standard set of questions was developed to guide the self-evaluation process. (The "Field Self-Evaluation Question Set" is provided in Attachment 6.) It is crucial for each designated facility to complete the question set as fully and accurately as possible.

DOE personnel assigned to coordinate this effort should have experience in chemical safety and should be able to analyze the data in a manner that will ensure consistency between

facilities. The local DOE line organization should provide input and analysis to the contractor organization throughout the self-evaluation process, thereby ensuring that the data are accurate and complete. The resulting analysis and supporting data should be submitted directly to the Deputy Chairperson of the Chemical Safety Vulnerability Working Group, in care of the Operations Management Division (EH-321), by April 4, 1994. Each submission should include both a hard copy and an electronic version (preferably in WordPerfect 5.1) of the self-evaluation.

It must again be stressed that the Working Group's schedule is extremely tight and does not make allowances for the late submission of field self-evaluations. These data will have a direct bearing on the field verification phase of the review and will drive the selection of sites to be visited by verification teams representing the Working Group. Because the Working Group has an obligation to obtain accurate and complete data for each facility listed in Attachment 4, it is in the interest of each site to ensure that this information is submitted in a timely manner.

The local DOE line organization is responsible for ensuring that vulnerabilities identified during the self-evaluation process are addressed either by an existing action plan or by a new entry into an appropriate tracking system. Determination of actions to be taken, milestones, and closeout requirements are the responsibility of line management through existing mechanisms.

Phase III - Field Verification

The field verification process is designed to use independent teams of safety professionals to verify the accuracy and completeness of the data provided by the field self-evaluations. The verification process also offers an opportunity to examine facility-specific chemical safety vulnerabilities and to make informed judgments about the seriousness of these conditions.

Nine sites participating in the field self-evaluations will be chosen for verification visits. The sites to be involved in the field verification process will be selected based on the core group's recommendation after review of completed field self-evaluation question sets. Site selection will be influenced by the need to obtain a balanced cross-section of DOE facilities, to conduct further investigation of selected facilities, and to verify questionable data or obtain missing data.

The Co-Chairmen of the Chemical Safety Vulnerability Working Group will assign team leaders to organize field verification visits, and teams will visit the nine selected sites during the dates specified in the schedule. Site visits are expected to last for 10 days, beginning on a Monday with inbriefings at the site and ending on a Wednesday with an outbriefing to site management.

The Co-Chairmen will assign a member of the core group to develop a guide for use by field verification teams during site visits. This guide will be developed while the field self-evaluations are being completed and will be provided to verification team members and to the sites selected for verification visits.

The field verification guide will describe team leader and team member responsibilities, team organization and staffing, report format, and lines of inquiry along five functional areas. The five functional areas for the lines of inquiry are as follows:

- Identification of chemical holdings, which will include the properties of chemicals located at the facility, the characterization of those chemicals, and an analysis of the inventory.
- Facility physical condition, which will include engineered barriers, maintenance conditions, chemical systems, safety systems, storage, monitoring systems, and hazards identification.
- Operational control and management systems, which will include organizational structure; requirements identification; hazard analysis; procedural adherence; maintenance control; engineering and design reviews; configuration control; safe shutdown plans; and site programs for quality assurance, chemical safety, inventory control, access control, disposal, transportation and packaging, and corrective actions.
- Human resource programs, which will include technical competence, staffing, training and qualifications, employee involvement, employee concerns, personnel performance requirements, and visitor and subcontractor control.
- Emergency response program, which will include the emergency response plan, incident consequences, environmental issues, coordination with the community, and community right-to-know issues.

During the verification process, all facilities included in the self-evaluations at a single site will be visited. Team members will interact with designated facility and site personnel to verify data and obtain needed information. These facility and site personnel will be asked to participate in factual accuracy reviews for identified chemical safety vulnerabilities. The team leader will meet with line management representatives on a daily basis to provide information about team activities.

Each team will characterize and prioritize the chemical safety vulnerabilities that are identified at each facility visited (see “Phase IV - Vulnerability Prioritization” below for an explanation of this process). The team will identify vulnerabilities that currently exist as well as the potential for vulnerabilities that may exist in the future. The team will also conduct an outbriefing with local DOE and M&O line management personnel at the conclusion of the site visit. At closeout, a list of prioritized facility-specific chemical safety vulnerabilities will be provided and any information needed to complete the evaluation will be identified. As with the field self-evaluation process, local DOE line organizations are responsible for ensuring that vulnerabilities identified during the field verification phase are addressed.

Phase IV - Vulnerability Prioritization

Vulnerability prioritization will be accomplished on both a facility-specific and a generic basis. Facility-specific prioritization will occur during field verification visits and will result in a list of facility-specific chemical safety vulnerabilities. Generic prioritization will occur after the field verification process and will result in a list of complex-wide chemical safety vulnerabilities.

Facility-specific vulnerabilities identified during field verifications will be prioritized in a manner that will facilitate the development and implementation of effective actions by local DOE line management to eliminate vulnerabilities or to reduce their potential consequences (see "Phase V - Management Response Plan Development" below for an explanation of this process). Prioritization will be based on informed judgments by safety professionals concerning the immediacy of the potential consequences posed by a vulnerability and on the potential severity of those consequences.

The criteria to be used for prioritizing facility-specific chemical safety vulnerabilities are provided in Attachment 7. The first step in the prioritization process will be to group vulnerabilities according to the timeframe in which they are expected to produce consequences. The next step will be to rank the priority of the vulnerabilities within each group according to the severity of their potential consequences.

After completion of the field self-evaluations and field verifications, the completed list of identified vulnerabilities will be analyzed by core group personnel for assignment to one of two areas:

- Facility-specific vulnerabilities, which are unique and have little or no relevance to other DOE facilities; and
- Generic vulnerabilities, which represent complex-wide problems.

To ensure that the list of vulnerabilities used in this analysis is complete, core group personnel will review the results of other departmental efforts in the area of chemical safety. These efforts include the DP organic-oxidizer review, the November 1992 study on chemical safety (see "Background" above), and recent reviews conducted through the EH Chemical Safety Program.

The prioritization of generic vulnerabilities will also use the criteria contained in Attachment 7. After the list of generic chemical safety vulnerabilities has been compiled, core group personnel will make an initial determination of the priority of generic vulnerabilities. The Working Group will review the results of this prioritization process and will recommend changes when it meets on June 7-8, 1994. The list of prioritized generic vulnerabilities will form the basis of the Working Group's final report and will provide a focus for developing the management response plan.

Phase V - Management Response Plan Development

To accompany the final report of the Chemical Safety Vulnerability Review, the Working Group will develop a management response plan to address actions that should be taken to eliminate or reduce the consequences associated with chemical safety vulnerabilities. Site organizations will be responsible for developing management response plans for identified facility-specific vulnerabilities. Vulnerabilities with "immediate" consequences should evoke prompt responses, whereas vulnerabilities with "long-term" consequences can be addressed over a longer period of time. Consequence severity should also be considered to determine the appropriate response time for a given vulnerability.

Local DOE line management will be responsible for responding to facility-specific chemical safety vulnerabilities identified during the field self-evaluations and field verifications and will track vulnerabilities using existing systems. Actions to eliminate or mitigate facility-specific vulnerabilities should be prioritized based on the immediacy and severity of the consequence, and strategies for corrective action should consider existing budgetary constraints. The prioritized lists of vulnerabilities for the nine sites that will be visited by field verification teams are intended to facilitate this process, (Note that new management response plans for facility-specific vulnerabilities identified during previous efforts and for which action plans already exist need not be developed. Copies of applicable portions of existing action plans should be provided to the Working Group concurrently with management response plans developed to address newly identified facility-specific vulnerabilities.)

The approval process for management response plans developed to address facility-specific chemical safety vulnerabilities identified during facility self-evaluations or by the Working Group during verification visits should be handled through routine line management channels. Local DOE line management should forward copies of management response plans for facility-specific vulnerabilities to the Working Group (in care of EH-321) by June 1, 1994. This submission will provide information needed by the Working Group to identify, characterize, and prioritize chemical safety vulnerabilities that confront the complex as a whole. The submission will also ensure consistency between the overall management response plan and the management response plans developed to address facility-specific vulnerabilities. (As already noted, sites need not develop new management response plans for facility-specific vulnerabilities identified during previous efforts and for which action plans already exist.)

After the field verifications are complete and the core group produces a prioritized list of the generic chemical safety vulnerabilities confronting the DOE complex, the Working Group will meet to review the list and to formulate input for an overall management response plan. Participation in this meeting will provide line management with an opportunity to contribute to a Department-wide response to chemical safety vulnerabilities. A subgroup representing the Working Group will then be tasked to develop the management response plan.

The management response plan for generic vulnerabilities should have a medium- to long-term emphasis that addresses issues related to programs, funding, and policy decisions for the Department as a whole. Generic vulnerabilities with immediate or short-term consequences should be turned over to the responsible Cognizant Secretarial Officer(s) for immediate action on an as-appropriate basis. In these cases, the Working Group will provide a coordinating role and the management response plan will document the actions to be taken.

Phase VI - Report Preparation

The Chemical Safety Vulnerability Working Group will submit a final report to the Secretary of Energy by July 29, 1994. The Co-Chairmen of the Working Group will assign a core group member to develop the final report format during the field self-evaluation phase of this review. The main body of the report should be geared toward providing senior DOE management with basic information on generic and facility-specific chemical safety vulnerabilities, which in turn can be used to formulate policy for important issues being addressed by the Department. The final report will be a concise summary of the Working Group's analyses and observations and

will include a number of appendixes containing extensive background information and data from the field self-evaluations and field verifications.

PROTOCOL

EH will lead the Chemical Safety Vulnerability Working Group and provide a core group of personnel to participate in and support the Working Group. The EH core group will provide staff resources to facilitate the organization and execution of the review.

Local DOE line management organizations will be responsible for the field self-evaluations and will be the main points-of-contact for the field verifications. To promote the involvement of local DOE line management and to permit completion of the project within the time provided, communication between the Working Group and facilities selected for self-evaluation will be handled through local DOE organizations. DOE line management will submit field self-evaluation data directly to the Chemical Safety Vulnerability Working Group.

Field verification teams will work closely with local DOE line management during verification visits. Vulnerabilities identified by these teams will be discussed with management personnel, who in turn should initiate responses through existing local mechanisms. Copies of action plans should be forwarded to the Working Group. Field verification teams will conduct an outbriefing with local DOE and M&O line management personnel at the conclusion of each site visit: a list of prioritized chemical safety vulnerabilities will be provided, and any information needed to complete the evaluation will be identified. DOE line management should address any facility-specific vulnerabilities that are identified as a result of the field self-evaluation or field verification processes.

The Co-Chairmen of the Chemical Safety Vulnerability Working Group will assign a member of the core group to develop a communication plan identifying required concurrences for the final report and to determine distribution schedules. The final report will be signed by the Assistant Secretary for Environment, Safety and Health.

The management response plan for generic DOE chemical safety vulnerabilities will be developed at a Working Group meeting after completion of the field verifications. The plan will thus be based on input provided by DOE line management personnel representing both field and programmatic elements. The management response plan will be developed and routed concurrently with the final report.

Attachment 1

CORE GROUP PERSONNEL

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Attachment 2

WORKING GROUP MEETING, MARCH 1-2, 1994

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Paul Hognroian, SAIC
Billie J. Holler, PMI
L.G. Hulman, Viking
Peggy Hunt, Battelle-Seattle
Jim Jackson, LLNL
David Johnson, PM I
Ed Kahal, WSRC
Thomas Kevem, PMI
Bernard Kokenge, BRK Associates
Fred Krach, FERMCO
John Krsul, ANL-W
Todd Lewis, Babcock and Wilcox
Frank Loudermilk, SNL
Jennifer Macauley, Battelle-Seattle
Julie Magness, EG&G Mound
Dick Meador, Battelle-Seattle
Mary Meadows, EMA
Leon H. Meyer, LHM Corp.
Christine Muller, Arthur D. Little

G.T. Paulson, WINCO
John Piatt, Battelle-PNL
Bryan Raughley, Roy F. Weston, Inc.
Lucille Reau, PM I
Cecellia Rogers, PMI
Steve Rohrer, EG&G Energy
Measurements
Carmen Romano, EG&G-METC
Tom Rudolph, WHC
Saleem Salaymeh, WSRC
Jack Salazar, LBL
Jeffrey Schinkel, LANL
John Schmerber, MK-Ferguson
Ann Schubert, WVNS
David W. Sheffey, MMES
Doug Shoop, WHC
Bob Skier, REECO

Lindy Smith, Battelle-Seattle
John S. Stone, KEH
Gary Street, WSRC
Pamela Sutherland, Battelle-Columbus
Gary Swearingen, Battelle-PNL
Donna J. Thompson, PMI
Dada Treat Courtney, EMA
Carol Vega, MSE
Larry Warren, Evergreen
Innovations, Inc.
James L. Woodring, ANL
Tommye Wright, Battelle-PNL
Bill Zwick, LANL

Other

David Lowe, DNFSB

CHEMICAL SAFETY VULNERABILITY WORKING GROUP
INITIAL MEETING

Gaithersburg Hilton
March 1-2, 1994

AGENDA

March 1, 1994

| | | |
|-------------|---|---------------|
| 7:30-8:30 | Seminar Registration | |
| 8:30-9:00 | Opening Remarks | J. Fitzgerald |
| 9:00-9:45 | Project Approach/Status | M. Kilpatrick |
| 9:45-10:00 | Break | |
| 10:00-10:45 | Definition of Vulnerabilities | O. Lynch |
| 10:45-11:45 | Define Breakout Group Process | Facilitators |
| 11:45-1:00 | Lunch | |
| 1:00-5:00 | Breakout Sessions | Facilitators |
| | . Breakout Groups 1 & 2- Establish Question Set for Field Self-Evaluations (DOE Contacts: Darrell Huff, EH-331, and Pat Worthington, EH-12) | |
| | • Breakout Group 3- Establish Process for Field Self-Evaluations and Field Verification Visits (DOE Contact: Bob Everson, EH-30.3) | |
| | “ Breakout Group 4- Establish Process for Characterization and Prioritization of Chemical Safety Vulnerabilities (DOE Contact: Vic Crawford, EH-24) | |
| | “ Breakout Group 5- Establish Process for Development of Management Response Plan (DOE Contact Brad Peterson, EH-321) | |
| 5:00-5:30 | Break (Refreshments served) | |
| 5:30-6:30 | Review of Toms-7 Incident* | C. Gilbert |
| 6:30-7:00 | ORPS Chemical Safety Lessons Learned* | K. Murphy |
| 7:00-7:30 | Other EH Chemical Safety Initiatives* | K. Murphy |

* Evening plenary sessions are optional. Designated breakout group leaders prepare for following day's presentations.

CHEMICAL SAFETY VULNERABILITY WORKING GROUP
INITIAL MEETING

AGENDA

March 2, 1994

| | | |
|---------------|--|---------------|
| 8:00-8:20 | Presentation of Breakout Group 1 | Group Leader |
| 8:20-8:40 | Presentation of Breakout Group 2 | Group Leader |
| 8:40-9:20 | Discussion - Question Set | All |
| 9:20-9:40 | Presentation of Breakout Group 3 | Group Leader |
| 9:40-10:10 | Discussion - Field Self-Evaluation and Verification Process | All |
| 10: 10-10: 30 | Break | |
| 10: 30-10: 50 | Presentation of Breakout Group 4 | Group Leader |
| 10: 50-11: 20 | Discussion - Prioritization of Vulnerabilities Process | All |
| 11: 20-11: 40 | Presentation of Breakout Group 5 | Group Leader |
| 11: 40-12: 10 | Discussion - Management Response Plan Process | All |
| 12: 10-1: 30 | Lunch | |
| 1: 30-2: 00 | Schedule of Future Project Activities | R, Hansen |
| 2: 00-3: 00 | Wrap-up and Summary | M. Kilpatrick |
| 3: 00 | Adjourn | |

Attachment 3

PROJECT SCHEDULE

| | |
|---------------------------|---|
| February 9, 1994 | Letter from the Assistant Secretary for Environment, Safety and Health (EH-1) to all departmental elements establishing the Chemical Safety Vulnerability Working Group and providing specific goals. |
| February 14, 1994 | Letter from the Secretary of Energy to the Assistant Secretary for Environment, Safety and Health tasking EH with the lead responsibility for conducting a thorough assessment of the chemical safety vulnerabilities associated with Department of Energy (DOE) facilities. |
| March 1-2, 1994 | Working Group meeting held in Gaithersburg, Maryland, to obtain input for project plan from line management (both DOE and contractor organizations). |
| March 318 | Field personnel conduct preliminary work and initiate self-evaluations using draft self-evaluation question set. |
| March 3-April 4, 1994 | Core group personnel develop guidelines for conducting field verification visits, assign team leaders, and staff field verification teams. |
| March 8, 15, 22, 29, 1994 | Conference calls conducted to facilitate field self-evaluation process. Calls will accommodate up to 60 participants. (To participate, call 301-903-7079 at 1:30 p.m., Eastern time.) |
| March 18, 1994 | Issue "Project Plan for the Chemical Safety Vulnerability Review." Send final copy of project plan with transmittal letter from the Assistant Secretary for Environment, Safety and Health to field and program management elements. |
| March 18-April 1, 1994 | Conduct field self-evaluations at designated facilities using established question set. Field self-evaluations will be forwarded to the Working Group through local DOE line management organizations, which will ensure the accuracy and completeness of the data submitted. |
| April 4, 1994 | Field self-evaluation inputs due to Deputy Chairperson of the Working Group. (Send to EH-321.) Both hard copy and electronic version (preferably in WordPerfect® 5.1) should be forwarded. |
| April 5-7, 1994 | Core group meeting held in Germantown, Maryland, to review self-evaluation input and to select candidates for field verification visits. |
| April 11, 1994 | Notify sites that will be visited as part of the field verification phase. |

| | |
|----------------------|--|
| April 18-27, 1994 | Three field verification teams make first round of visits to three selected sites. |
| May 2–11, 1994 | Three field verification teams make second round of visits to three selected sites. |
| May 16-25, 1994 | Three field verification teams make third round of visits to three selected sites. |
| May 31–June 3, 1994 | Core group meeting in Germantown to categorize and prioritize complex-wide chemical safety vulnerabilities. |
| June 1, 1994 | Site management response plans for facility-specific vulnerabilities due to Deputy Chairperson of Working Group (in care of EH-321). |
| June 6-July 29, 1994 | Draft final report. Conduct parallel process to develop management response plan. |
| June 7–8, 1994 | Working Group meeting to review categorization and prioritization of complex-wide chemical safety vulnerabilities and to develop input for the overall management response plan. |
| June 9-July 29, 1994 | Draft management response plan. |
| June 30, 1994 | Draft report and management response plan to Joseph E. Fitzgerald, Jr., Deputy Assistant Secretary for Safety and Quality Assurance (EH-30). |
| July 8, 1994 | Draft report and management response plan to Dr. Tara O'Toole, Assistant Secretary for Environment, Safety and Health. |
| July 15, 1994 | Final report and management response plan to printer. |
| July 29, 1994 | Final report and management response plan due to Hazel R. O'Leary, Secretary of Energy. |
| July 29, 1994 | Study of organic-oxidizer explosion vulnerabilities scheduled for completion by the Office of Defense Programs. |

Attachment 4

LIST OF SELECTED SITES AND FACILITIES

| Albuquerque Operations Office | Facility Codes |
|--|----------------|
| Los Alamos National Laboratory (DP) | |
| Gas Cylinder Distribution Plant, Building TA-3-170 | 5 |
| Tritium High Pressure Lab, Building TA-33-86 | 4 |
| Waste Storage Facilities, Technical Area 54 | 6 |
| S-Site Explosives Blending Facility, Building TA-1 6-0342 | 1,3 |
| Chemical and Metallurgy Research Facility, Building TA-3-29 | 3,4 |
| Sandia National Laboratory (DP) | |
| Microprocessor Development Laboratory, Building 858 | 3 |
| Laboratory Facilities, Buildings 805, 806, and 807 | 1 |
| Process Development Laboratory, Building 878 | 3 |
| Hazardous Waste Management Facility, Building 958 | 6 |
| Light Initiated Explosive Test Facility | 1 |
| Mound Plant (DP) | |
| Process/Laboratory Facility, WD and WDA Buildings | 1 |
| Hazardous Waste Storage, Building 72 | 6 |
| PETN Recrystallization Facility, Building 27 | 3 |
| Explosives Formulation Facility, Building 1 | 4 |
| Pantex Plant (DP) | |
| Sewage Treatment Facility, Building 13-47 | 8 |
| High Explosives Synthesis Facility, Building 11-36 | 3 |
| Explosives Machining Facilities, Buildings 11-50 and 12-24N | 3 |
| Kansas City Plant (DP) | |
| Tank Farm | 6 |
| Storage Facilities (Acid pad, Lot L, and Red X) | 6 |
| Industrial Waste Water Pretreatment Plant | 8 |
| Pinellas (DP) | |
| Tank Farm at the Liquid Waste Storage Area near Building 1000 | 6 |
| Industrial Wastewater Neutralization, Building 550 | 8 |

Chicago Operations Office**Facility Codes**

| | |
|--|----|
| Argonne National Laboratory-East (ER) | |
| Chemistry Division, Building 200 (M-Wing Hot Cells) | 1 |
| Chemistry Technology, Building 205 (IFR Pyroprocessing) | 1 |
| Waste Ion Exchange Facility, Building 579 | 11 |
| Argonne National Laboratory-West (NE) | |
| Operations Laboratory Facility, Building E 752 | 1 |
| Brookhaven National Laboratory (ER) | |
| Hazardous Waste Storage Facility | 6 |
| Wastewater Treatment Facility, Building 575 | 8 |
| Tank 490-07 | 11 |

Fernald Field Office

| | |
|---|----|
| Fernald Environmental Restoration Management Corporation (EM) | |
| Bulk Chemical Storage (HF Tank Car) | 5 |
| Biodenitrification Facility (Tower, Building 18d; Sulfuric Acid Tank; Methanol Tank, Facility 18j) | 4 |
| Silo 3 | 10 |
| Water Treatment Plant, Buildings 20A and 206 | 8 |

Golden Field Office

| | |
|--|---|
| National Renewable Energy Laboratory (EE) | |
| R&D Laboratory, Denver West Office Park, Building 16 | 1 |
| Field Test Laboratory Building, South Table Mountain Site | 1 |

Idaho Operations Office

| | |
|--|----|
| Idaho National Engineering Laboratory (NE/EM/DP) | |
| Army Reentry Vehicle Facility Site (ARVFS) | 10 |
| RWMC (Waste Storage Pad A, Waste Disposal Pit 9) | 7 |
| Power Burst Facility, Corrosive Waste Disposal Evaporation Pond | 11 |
| Argonne Experimental Facility, Waste Management Building 603 | 11 |

| | Facility Codes |
|--|----------------|
| Idaho National Engineering Laboratory (cont.) | |
| ICPP Tank Farm | 6 |
| ICPP Fuel Processing Facility, Buildings 601–602 | 4 |
| West Valley Demonstration Project (EM) | |
| Analytical Environmental Laboratory | 4 |
| Supernate Treatment System | 4 |
| Hazardous Waste Storage Locker | 4 |
| Morgantown Energy Technology Center | |
| Morgantown Energy Technology Center (FE) | |
| Chemical and Gas Storage B-1 6 | |
| Wastewater Treatment Facility | |
| Nevada Operations Office | |
| Nevada Test Site (DP) | |
| North Las Vegas Facility, Building 710 | 1 |
| Area 23, REECO Facility, Analytical Laboratories | 1 |
| Area 25, Flammable Storage Dock at Building 4320 | 11 |
| Area 25, Acid Storage Tank at Nuclear Engine Test Stand | 11 |
| Oakland Operations Office | |
| Lawrence Berkeley Laboratory (ER) | |
| Microelectronic Research Systems Laboratory, Building 70-A | 1 |
| Lawrence Livermore National Laboratory (DP) | |
| Chemistry Processing Facility, Site 300, Building 827 | 2 |
| Chemical and Materials Sciences Facility, Building 235 | 1 |
| R&D Laboratory for Explosives, Buildings 222-229 | 4 |
| Energy Technology Engineering Center (NE) | |
| RDM Facility, Buildings 020 and 029 | 9 |
| Kalina Facility | 3 |
| Sodium Storage | 7 |

Oak Ridge Operations Office**Facility Codes**

Y-1 2 Plant (DP)
Hazardous Materials Bulk Storage, Building 9201-4
Compressed Gas Storage, Main Warehouse,
Building 972*5

5
5

Oak Ridge National Laboratory (ER)
Hazardous Waste Site (Emergency Waste Pond,
7821; Chemical Waste Evaporator Building, 3506;
and Contractor Landfill, 7658)

6

K-25 Site (EM/NE)
Ponds Waste Management Project
Lithium Storage Vaults, Building K-25
Contaminated Burial Ground

7
6
11

Petroleum Reserves

Naval Petroleum Reserve in California (FE)
35R Complex

Strategic Petroleum Reserve (FE)
West Hackberry Facility

Pittsburgh Energy Technology Center

Pittsburgh Energy Technology Center (FE)
Wastewater Treatment Facility

8

Power Marketing Administrations

Bonneville Power Administration (DS)
Ross Maintenance Facility (Heavy Duty Equipment
Garage; Hazardous Material/Waste Storage,
Treatment, and Disposal Facility)

3

Western Area Power Administration (DS)
Phoenix Maintenance Facility (Heavy Duty
Equipment Garage; Hazardous Material/Waste
Storage, Treatment, and Disposal Facility)

3

Richland Operations Office

Facility Codes

Hanford (EM/ER)

| | |
|--|---|
| Plutonium Laboratory Facility, Building 234-5Z | 4 |
| Energy Laboratory, Building 2703 E | 2 |
| Chemical Energy (High Bay), Building 324 | 2 |
| Life Sciences Laboratory, Building 331 | 1 |
| PUREX Plant | 4 |

Rocky Flats Office

Rocky Flats Plant (DP/EM)

| | |
|--|-----|
| Waste Storage and Analytical Laboratory, Building 371 | 1,6 |
| Warehouse and Machine Shop, Building 551 | 3 |
| Analytical Laboratory, Building 559 | 1 |
| Analytical Laboratory, Building 881 | 7 |
| Industrial Waste Storage Tank, Building 207 | 10 |

Savannah River Operations Office

Savannah River Site (DP)

| | |
|--|---|
| 400-D Area, Heavy Water Extraction Facility | 3 |
| 200-H Area, Maintenance Facility, Building 299 | 3 |
| ITP/ESP, Waste Reduction/Wastewater Facility | 3 |
| H-Area Tank Farm, Waste Reduction Facility | 3 |
| 200-F Area, CTS Pits and Facilities, No. 242-003 | 9 |
| 100-P Area, Sodium Hypochlorite Facility, No. 186-001 | 9 |

NOTE: Cognizant Secretarial Offices and Facility Codes are defined as follows:

| | |
|--|---|
| DP = Office of Defense Programs | 1 = Operating or shutdown laboratory |
| DS = Office of the Deputy Secretary | 2 = Operating or shutdown pilot plant |
| EE.= Office of Energy Efficiency and Renewable Energy | 3 = Operating process facility |
| EM = Office of Environmental Restoration and Waste Management | 4 = Shutdown or standby process facility |
| ER = Office of Energy Research | 5 = Operating chemical storage facility |
| FE = Office of Fossil Energy | 6 = Operating waste storage/disposal facility |
| NE = Office of Nuclear Energy | 7 = Shutdown waste storage/disposal facility |
| | 8 = Operating utility |
| | 9 = Shutdown EM facility |
| | 10 = Transition EM facility |
| | 11 = Abandoned facility |

Attachment 5

FACILITY SELECTION CRITERIA

BACKGROUND

Field self-evaluations will be the primary mechanism by which identification and characterization of adverse conditions or circumstances involving potentially hazardous chemicals will be determined at facilities owned or operated by the Department of Energy (DOE).

Field self-evaluation question sets (see Attachment 6) developed by the Chemical Safety Vulnerability Working Group will be distributed to 84 facilities at 29 DOE sites. The question sets will be used to collect specific information related to the handling, storage, use, and disposal of hazardous chemicals and waste. After completion of the field self-evaluations, nine DOE sites will be selected for field verification visits by teams of safety professionals representing the Working Group.

Core group personnel assigned to the Working Group used the criteria described in this attachment to select facilities and sites for participation in the field self-evaluations.

CRITERIA FOR SELECTION OF FACILITIES FOR SELF-EVALUATION

Identification of vulnerabilities arising from hazardous chemicals and wastes at DOE sites requires examination of all types of chemical- and waste-handling facilities, including laboratories, process facilities, and waste treatment and storage facilities.

Selection of Candidate Facilities

To begin the selection process, Operations Managers and Site Representatives assigned to the Office of Safety and Quality Assurance (EH-30) were asked to identify candidate chemical- and waste-handling facilities from the sites for which they have oversight responsibility. The Operations Managers and Site Representatives provided summary information about these facilities to core group personnel, who then evaluated the information and selected a cross-section of facilities for participation in the field self-evaluations.

Operations Managers and Site Representatives used their professional judgment and knowledge of DOE sites to recommend candidate facilities. For each selected site, the Operations Managers and Site Representatives recommended up to 10 facilities as candidates for participation in the field self-evaluations. The facilities recommended by the Operations Managers and Site Representatives met the definition of candidate facilities provided below.

In situations where a selected site included multiple candidate facilities with similar profiles (i.e., facilities containing the same chemicals or wastes and performing the same operations or functions), the Operations Managers and Site Representatives used their knowledge and professional judgment to recommend individual facilities for participation in the field self-evaluations.

Definition of a Candidate Facility

For the purpose of selecting candidate facilities for field self-evaluation, a candidate facility is defined as a process facility, laboratory, handling operation, storage facility, or waste area that meets one or more of the following criteria:

- Type A* Contains hazardous (toxic, flammable, or explosive) chemicals with inventories exceeding approximately 25 percent of the threshold quantities stipulated by the Occupational Safety and Health Administration (OSHA).'
- Type B* Contains chemical mixtures, byproducts, intermediate products, or other products that have evolved as a result of process upset for which constituents are hazardous, as defined above, and exist in quantities exceeding the percentages stipulated by OSHA.'
- Type C* Contains large numbers of hazardous or unknown chemicals in small quantities.
- Type D* Contains characterized hazardous waste or mixed waste.
- Type E* Contains wastes whose constituents are unknown.

This list of chemical and waste facility characteristics is not provided in order of rank. Rather, it attempts to capture probable types of facilities that should be included in the current review. Thus, Types A and B will probably include process facilities, pilot plants, chemical storage facilities, and utilities. Most Type C facilities will probably be laboratories. Types D and E will probably include waste-handling, treatment, and storage facilities. Because Type E facilities (which contain wastes with unknown constituents) are inherently vulnerable, they have been identified separately from Type D facilities (which house wastes that have been characterized as hazardous or mixed).

There are probably fewer Type A and B facilities in the DOE complex than Type D and E facilities. Therefore, Type A and B facilities were more likely to be identified and selected by Operations Managers and Site Representatives as candidates for self-evaluation. However, the Operations Managers and Site Representatives used their knowledge, expertise, and best judgment to select representative examples of all five facility types.

Summary Information for Candidate Facilities

At selected sites, Operations Managers and Site Representatives designated up to 10 candidate facilities containing hazardous chemicals and hazardous wastes, providing the following information for each:

- Facility name;
- Facility location;
- DOE field organization and management and operating contractor
- Type of facility (e.g., laboratory, pilot plant, waste storage facility);
- Operating status;
- Approximate inventory of hazardous chemicals or hazardous wastes (types and quantities); and
- Preliminary characterization of chemical hazards.

FACILITY SELECTION PROCESS

A small team of core group personnel reviewed the information provided by the Operations Managers and Site Representatives and selected a limited cross-section of these facilities and sites for participation in the field self-evaluations.

At least three of each of the following candidate facilities were selected using the criteria described above:

- Operating or shutdown laboratory;
- Operating or shutdown pilot plant;
- Operating process facility;
- Shutdown or standby process facility;
- Operating chemical storage facility;
- Operating waste storage/disposal facility;
- Shutdown waste storage/disposal facility;
- Operating utility (e.g., water treatment facility);
- Shutdown facility under the cognizance of the Office of Environmental Restoration and Waste Management (EM) (undergoing decontamination and decommissioning, or D&D);
- Transition facility under EM cognizance (not yet undergoing D&D); and
- Abandoned facility.

In addition, facilities at each site that gave rise to serious concerns about chemical hazards were included, as follows:²

- Facilities (maximum of five) experiencing serious or frequent chemical accidents within the past 2 years.
- Facilities (maximum of five) for which the Office of Environment, Safety and Health had conducted comprehensive chemical safety evaluations within the past 2 years.
- Facilities determined to contain large quantities or large numbers of hazardous or unknown chemicals (i.e., identified during the EM Surplus Facility Inventory and Assessment Project).

NOTES

¹The list, contained in the November 22, 1993, memorandum issued by Assistant Secretary Tara O'Toole to Cognizant Secretarial Offices and DOE Operations Office Managers, "Survey of Chemical Processes within the Department of Energy (DOE) Complex," specified chemicals and threshold quantities regulated by OSHA (see 29 CFR 1910.119, "Process Safety Management of Highly Hazardous Chemicals") and by the Environmental Protection Agency (see 40 CFR 68, "Risk Management Programs for Chemical Accidental Release Prevention").

²These facilities need not be identified by Operations Managers or Site Representatives as candidate facilities. Information on chemical accidents and incidents at DOE facilities, including facilities experiencing serious or frequent chemical accidents within the past 2 years, was identified by John Usher of Brookhaven National Laboratory. Information on facilities undergoing comprehensive chemical safety evaluations within the past 2 years was obtained, in part, from DOE/EH-0282, "Task Group Report to the Assistant Secretary for Environment, Safety and Health on Oversight of Chemical Safety at the Department of Energy," dated November 1992.

ATTACHMENT 6

FIELD SELF-EVALUATION QUESTION SET

This question set should be applied to the Department of Energy (DOE) operation that you will describe in Question 1 below. Each question should be answered completely, using all applicable elements listed.

For Questions 1-4, provide sufficient detail (1) to provide accurate definitions of environment, safety, and health (ES&H) concern(s) relative to existing or projected conditions; (2) to note where elements have not been programmatically addressed or where a significant level of knowledge about the elements is lacking; and (3) to provide sufficient information to perform the vulnerability identification discussed in the project plan.

1. **Identify the facility. (See Attachment 4 for a list of selected facilities.) What is the condition of the facility associated with the DOE operation being evaluated? Provide the following information for the facility.**
 - (a) What is the name and identifying number (or other designator) of the facility? Briefly describe the facility, including its size or capacity.
 - (b) Identify the cognizant DOE Program Office, DOE field organization, facility representative, management and operating contractor, environmental restoration management contractor, and previous contractors responsible for this facility.
 - (c) What is the current (or most recent) mission of the facility? (Use the following terminology to describe the facility mission.)

Mission of Facility

Process facility

Nuclear reactor

Assembly/Disassembly facility

Pilot plant

Machinery/General industry

Laboratory

Plating

Chemical storage facility or warehouse

Utility

Waste storage facility or site

Waste treatment facility

Waste disposal facility or site

Waste/environmental remediation area

- (d) What is the current life cycle phase? (Indicate all that apply and explain.)

Operational Status of the Facility

Operating

Abandoned

Inactive-standby

Inactive-shutdown

Undergoing D&D

Surveillance and maintenance

Deactivation

Deinventory

Other (Provide a brief explanation.)

- (e) What was the original function (as initially constructed) of the facility? Has the facility been used for other functions since it was constructed? Identify.
- (f) Are there chemical safety concerns associated with the facility because of the codes and standards to which it was built or modified. If so, explain.
- (g) Is the mission of the facility expected to change within the next 3 years? If so, how?
- (h) What is the shortest distance from this facility to the site boundary?
- (i) Provide the number of occupants normally expected to be located within this facility. Provide an estimate of the number of people normally expected to be within 100 meters of the facility.
- (j) Provide additional comments that you may have or concerns regarding the physical condition of the facility that may involve a chemical safety concern.

2. Describe the chemical inventory of the facility.

- (a) Characterize the quality of existing chemical inventory data for the following (use a one-word description, followed by a short explanation of the basis):

- Hazardous chemicals;
- Hazardous wastes (including mixed wastes); and
- Chemical residuals.

- (b) Describe the facility hazardous chemical inventory as follows:

- Are hazardous chemicals present in quantities that meet or exceed 25 percent of those listed in either 29 CFR 1910.119 or 40 CFR 68? If so, complete Table 1.
- Are hazardous chemicals (below the 25-percent threshold stipulated above) present that do not have adequate controls to prevent worker exposures? If so, complete Table 1.

- * For nonoperating facilities, were operations terminated with hazardous chemicals still inline? If so, specify location and contents (if known) in Table 1.
 - Identify any other concerns involving hazardous chemicals that were not covered above or that you believe need to be addressed. Specify these concerns and complete Table 1 for these chemicals.
- (c) Describe the hazardous waste inventory as defined in 40 CFR 261, Subpart D, or in more stringent State regulations, where applicable.
- Does the facility contain waste that has not been characterized? Briefly provide any information known about the waste (e.g., quantity or physical state).
 - Does the facility currently generate hazardous waste? If so, explain and give the current rate of generation.
 - ^b Is hazardous waste stored in the facility? If so, explain. Are adequate controls in place? If not, complete Table 1.
 - Does the facility contain mixed waste? If so, give total volume. Provide relevant information that is not already included in Table 1.
 - Is this a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or environmental restoration site? Has it been characterized? If so, to what extent? If characterized, complete Table 1. If uncharacterized describe situation and existing plans or controls.
 - Does the facility contain waste covered by the DOE moratorium? If so, provide total volume.
- (d) Describe hazardous chemical residuals at the facility.
- Are hazardous chemical residuals present on or in systems, structures, or components? Briefly describe conditions and types (i.e., characteristics) of these chemicals.
 - * Are there chemical safety concerns because of these residuals? If so, describe.
- (e) Provide additional comments or concerns that you may have regarding the inventory of hazardous chemicals or hazardous waste stored in the facility.

³The DOE Office of Waste Operations (EM-30) issued a moratorium on the shipment of hazardous waste from radiologically contaminated or potentially contaminated areas at DOE sites to offsite facilities not licensed for radiological material. See memorandum from Jill E. Lytle (EM-331) to Distribution, "Shipment of Waste Originating in Radiation Control Areas," dated May 17, 1991.

3. What programs and management systems (e.g., conduct of operations and institutional controls) are in place to control the risks associated with the hazardous processes, chemicals, or wastes identified in Question 2.

- (a) Identify program and management systems for the facility that pertain to chemical safety. Fill in Table 2 as applicable. (Note the following examples.)

Safe work program
Safety analysis
Emergency operating procedures or plan
Training and qualifications
Preventive maintenance
Radiation protection (if applicable)
Industrial hygiene program
Industrial safety program
Quality assurance
Conduct of operations implementation plan
Hazard analysis
Management plans (e.g., management response plans)
Environmental analysis
Transition plan
Decommissioning and demolition plan
Environmental restoration plans
Industrial hygiene survey

- (b) Are there significant regulatory drivers, such as DOE Orders or required permits, associated with the programs and management systems in 3(a) above? Complete Table 2 as applicable. (Note the following examples.)

Statutory requirements
Environmental agreements, certifications, and permits (including time constraints)
Federal and State agreements

- (c) For programs and systems identified in Question 3(a), provide a brief summary of associated documents and their adequacy.

- (d) Describe any other programmatic and management concerns related to chemical safety.

4. Have there been any reportable events involving hazardous material within the past 4 years?

- (a) Briefly describe any Type A or Type B investigations and provide the appropriate references. Provide the number of events that led to Type C investigations. Describe (only as an overall summary) the Type C investigations for the sample period. Refer to DOE 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements," Chapter 1, issued June 29, 1990, for definitions of accidents types.

- (b) Are there any unresolved issues related to any events that led to the Type A or Type B investigations identified above? If so, briefly describe.
 - (c) Briefly describe any unusual occurrences (as defined by DOE 5000.3B, "Occurrence Reporting and Processing of Operations Information," issued May 30, 1990) involving chemicals.
 - (d) Briefly describe any workplace conditions that contributed to, or may contribute to, worker exposure to chemicals above applicable exposure levels.
5. **Describe the ES&H concerns related to chemical safety at the facility that require the most immediate attention.**
6. **(Optional) Share any commendable programs or practices related to chemical safety.**

TABLE I -HAZARDOUS CHEMICAL AND WASTE INVENTORY

| HAZARDOUS CHEMICAL, WASTE NAME OR CHARACTERISTIC (for CERCLA sites) | QTY (LBS) | FORM | CHARACTERISTIC (DOT) | CONDITION OF CHEMICAL | LOCATION | NUMBER of CONTAINERS/ EQUIPMENT | CONDITION+4 of CONTAINERS/ EQUIPMENT | EXISTING DISPOSITION PLAN YIN | EXISTING CONTROL PROGRAM YIN | COMMENTS OR CLARIFYING REMARKS |
|---|--------------|------|-------------------------|-----------------------------|----------|--|---|--|---------------------------------------|---|
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NOTE: Instructions for filling out the form are on the back

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| HAZARDOUS CHEMICAL; WASTE NAME OR CHARACTERISTICS | Enter the name as given in 29 CFR 1910.119 or 40 CFR 68. If the chemical form is not yet known, enter "unknown" in this field. For CERCLA or environmental restoration sites, include information based on characterization. |
| FORM | Enter "L for liquid, "S" for solid, and "G" for gas. If the material is declared as waste, also enter "MW for mixed waste and "W for nonmixed waste (e.g., S-MW). |
| CHARACTERISTIC | To complete this column, refer to definitions provided in DOE 5480.3, "Safety Requirements of Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Waste," issued July 9, 1985. |
| LOCATION | Enter a brief code that describes the current storage location within the facility. If necessary, provide a simple coded map of the facility to facilitate understanding the codes that are provided. |
| CONDITION OF CHEMICAL | Condition of chemicals (e.g., aging, unstable, deteriorating) |
| CONDITION OF CONTAINERS/ EQUIPMENT | Enter "G" for good, "F" for fair, and "P for poor. If conditions of containers vary, give the number of containers in each category (e.g., 2-G, 3-F, 1-P). |
| EXISTING DISPOSITION PLAN | If the answer is "Y," provide a comment reference for the document(s) that contain the associated disposition plan(s). |
| CONTROL PROGRAM IN PLACE | If "Y" provide comments or references. May also reference other responses within this questionnaire. |
| COMMENTS/ CLARIFYING REMARKS | (as necessary) |

Attachment 7

CHEMICAL SAFETY VULNERABILITY PRIORITIZATION CRITERIA

The criteria in this attachment are intended to provide chemical safety professionals with general guidelines by which informed judgments can be made about the significance of identified chemical safety vulnerabilities. These criteria will be used by field verification teams to prioritize facility-specific vulnerabilities and by the EH core group to prioritize generic (i.e., complex-wide) vulnerabilities.

A vulnerability will be determined to exist if current or expected future conditions or weaknesses could result in the following:

- The death of or serious physical harm⁴ to a worker or a member of the public or continuously exposing a worker or member of the public to levels of hazardous chemicals above hazardous limits; or
- Environmental impacts through the release of hazardous chemicals to the environment above established limits.

Vulnerabilities should first be prioritized based on the timeframe within which the consequences are expected to occur. The following categories should be used:

- Immediate Consequence - Any chemical safety vulnerability that could result in immediate consequences.
- Short-Term Consequence - Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring within a 3-year timeframe as a result of chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors affecting the facility.
- Medium-Term Consequence - Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring in a 3-10-year timeframe as a result of chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors impacting the facility.
- Long-Term Consequence - Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring in the timeframe greater than 10 years as a result of chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors impacting the facility.

⁴Serious physical harm is defined as impairment of the body, leaving part of the body functionally useless or substantially reducing its efficiency on or off the job.

Within each category, the vulnerability should be further prioritized. Vulnerabilities should be specified as “high,” “medium,” or “low” priority based on the potential severity of the consequence. Examples of how vulnerabilities should be further prioritized include the following:

- Potential worker or public harm could be further prioritized based on the possible level of injury and/or health effects, ranging from transient reversible illness or injury to death.
- Environmental impacts could be further prioritized based on the level of irreversible damage and/or restoration costs.